AMENDMENTS TO THE CLAIMS

1. (CURRENTLY AMENDED) A method of estimating a transmission channel ~~(302)~~ in a digital communications system including a receiver ~~(303)~~ for receiving signal bursts of a communications signal via the transmission channel, the receiver comprising a channel estimation-based equalizer ~~(308)~~ having an equalizer window, the method comprising:

receiving ~~(401)~~ a signal burst ~~(101, 201)~~ of the communications signal over the transmission channel, the signal burst including a sequence of training symbols ~~(110, 202)~~;

determining ~~(305)~~ a desired synchronization position ~~(203)~~ of the sequence of training symbols with respect to the received signal burst;

~~characterized in that~~

wherein the step of determining a desired synchronization position further comprises:

determining ~~(403)~~ a number of estimates (h) of the transmission channel as a function of the synchronization position (p) and a size of the equalizer window (m); and

determining ~~(405)~~ a desired synchronization position and a desired size of the equalizer window by calculating ~~(404)~~ an error measure (ε) based on the received signal burst and the determined estimates for a number of selected values of the synchronization position and of the size of the equalizer window, where the values of the size of the equalizer window are selected between predetermined upper (m_u) and lower (m_l) bounds.

2. (CURRENTLY AMENDED) ~~A~~ The method according to claim 1, ~~characterized in that~~ wherein the predetermined upper and lower bounds define an interval having a width which is less than four channel taps~~, preferably less than three channel taps~~.

3. (CURRENTLY AMENDED) ~~A~~ The method according to claim 1 or 2, ~~characterized in that~~ wherein the method further comprises determining ~~(306, 406)~~ the upper and lower bounds based on at least a desired size of the equalizer window as determined for a previously received signal burst.

4. (CURRENTLY AMENDED) ~~A~~ The method according to claim 3, ~~characterized in that~~ wherein the step of determining the upper and lower bounds further comprises:

determining a reference window size by means of an auto regressive filter which is updated for at least a subset of received bursts based on the determined desired size of the equalizer window for each of at least the subset of received bursts; and

selecting the upper and lower bounds to define an interval having a predetermined width around the determined reference window size.

5. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of claims~~ claim 1 ~~through 4~~, ~~characterized in that~~ wherein the step of determining a desired synchronization position and a desired size of the equalizer window comprises calculating a difference between a calculated signal power of the received signal and a scaled power of a set of channel taps of the estimate of the transmission channel.

6. (CURRENTLY AMENDED) ~~A~~ The method according to claim 5, ~~characterized in that~~ wherein the method further comprises scaling the calculated difference with a penalty factor penalizing large equalizer windows.

7. (CURRENTLY AMENDED) ~~A~~ The method according to claim 6, ~~characterized in that~~ wherein the penalty factor comprises an exponential function of the equalizer span with a base determined by a length of the training sequence.

8. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of claims~~ claim 1 ~~through 7~~, ~~characterized in that~~ wherein the communications signal comprises a signal in accordance with the GSM specifications.

9. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of the claims~~ claim 1 ~~through 7~~, ~~characterized in that~~ wherein the communications signal comprises a signal in accordance with the EDGE specifications.

10. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of the claims~~ claim 1 ~~through 8~~, ~~characterized in that~~ wherein the step of determining a number of estimates of the transmission channel comprises selecting a subset of the number of training symbols.

11. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of the claims~~ claim 1 ~~through 9~~, ~~characterized in that~~ wherein the step of determining a number of estimates of the transmission channel comprises determining channel taps of the estimate of the transmission channel for different synchronization positions and different sizes of the equalizer window by a two-dimensional recursive computation step.

12. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of claims~~ claim 1 ~~through 11~~, ~~characterized in that~~ wherein:

the step of determining a desired synchronization position and a desired size of the equalizer window by calculating an error measure based on the received signal burst and the determined estimates for a number of selected values of the synchronization position and of the size of the equalizer window further comprises selecting ~~(702)~~ the values of the size of the synchronization position between predetermined upper (p_u) and lower (p_l) bounds; and

the method further comprises determining ~~(706)~~ the upper and lower bounds for selecting the values of the size of the synchronization position based on at least a desired synchronization position determined for a previously received signal burst.

13. (CURRENTLY AMENDED) ~~A~~ The method according to claim 12, ~~characterized in that~~ wherein the step of determining the upper and lower bounds for selecting the values of the size of the synchronization position further comprises:

determining a reference synchronization position by means of an auto regressive filter which is updated for at least a subset of received bursts based on the determined desired synchronization position for each of at least the subset of received bursts; and

selecting the upper and lower bounds for selecting the values of the size of the synchronization position to define an interval having a predetermined width around the determined reference synchronization position.

14. (CURRENTLY AMENDED) An arrangement for estimating a transmission channel ~~(302)~~ in a digital communications system including a receiver ~~(303)~~ for receiving signal bursts of a communications signal via the transmission channel, the receiver comprising a channel estimation-based equalizer ~~(308)~~ having an equalizer window, the arrangement comprising:

means ~~(304)~~ for receiving a signal burst of the communications signal over the transmission channel, the signal burst including a sequence of training symbols;

means ~~(305)~~ for determining a desired synchronization position (p) of the sequence of training symbols with respect to the received signal burst;

~~characterized in that~~ wherein the means for determining a desired synchronization position is adapted to:

determine a number of estimates of the transmission channel as a function of the synchronization position and a size of the equalizer window (m); and ~~to~~

determine a desired synchronization position and a desired size of the equalizer window by calculating an error measure (ε) based on the received signal burst and the determined estimates for a number of selected values of the synchronization position and of the size of the equalizer window, where the values of the size of the equalizer window are selected between predetermined upper (m_u) and lower (m_l) bounds.

15. (CURRENTLY AMENDED) A receiver ~~(303)~~ for receiving signal bursts of a communications signal via a transmission channel ~~(302)~~ in a digital communications system, the receiver comprising a channel estimation-based equalizer ~~(308)~~ having an equalizer window and an arrangement for estimating the transmission channel, the arrangement comprising:

means ~~(304)~~ for receiving a signal burst of the communications signal over the transmission channel, the signal burst including a sequence of training symbols;

means ~~(305)~~ for determining a desired synchronization position (p) of the sequence of training symbols with respect to the received signal burst;

~~characterized in that~~ wherein the means for determining a desired synchronization position is adapted to:

determine a number of estimates of the transmission channel as a function of the synchronization position and a size of the equalizer window (m); and ~~to~~

determine a desired synchronization position and a desired size of the equalizer window by calculating an error measure (ε) based on the received signal burst and the determined estimates for a number of selected values of the synchronization position and of the size of the equalizer window, where the values of the size of the equalizer window are selected between predetermined upper (m_u) and lower (m_l) bounds.

16. (CURRENTLY AMENDED) A method of estimating a transmission channel ~~(302)~~ in a digital communications system including a receiver ~~(303)~~ for receiving signal bursts of a communications signal via the transmission channel, the receiver comprising a channel estimation-based equalizer ~~(308)~~ having an equalizer window, the method comprising:

receiving ~~(701)~~ a signal burst ~~(101, 201)~~ of the communications signal over the transmission channel, the signal burst including a sequence of training symbols ~~(110, 202)~~;

determining ~~(305)~~ a desired synchronization position ~~(203)~~ of the sequence of training symbols with respect to the received signal burst from a number of estimates (h) of the transmission channel corresponding to a number of selected values of the synchronization position (p); and

~~characterized in that~~ wherein the step of determining a desired synchronization position further comprises determining ~~(706)~~ an upper (p_u) and a lower (p_l) bound for the synchronization position based on at least a desired synchronization position determined for a previously received signal burst; and selecting ~~(702)~~ the number of selected values of the synchronization position between the determined upper and lower bounds for the synchronization position.

17. (CURRENTLY AMENDED) ~~A~~ The method according to claim 16, ~~characterized in that~~ wherein the step of determining an upper and a lower bound for the synchronization position further comprises

determining a reference synchronization position by means of an auto regressive filter which is updated for at least a subset of received bursts based on the determined desired synchronization position for each of at least the subset of received bursts; and

selecting the upper and lower bounds for selecting the values of the size of the synchronization position to define an interval having a predetermined width around the determined reference synchronization position.

18. (CURRENTLY AMENDED) ~~A~~ The method according to claim 16 or 17, ~~characterized in that~~ wherein the communications signal comprises a signal in accordance with the GSM specifications.

19. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of the claims~~ claim 16 ~~through 18~~, wherein ~~characterized in that~~ the communications signal comprises a signal in accordance with the EDGE specifications.

20. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of the claims~~ claim 16 ~~through 19~~, ~~characterized in that~~ wherein the number of estimates of the transmission channel are based on a selected subset of the number of training symbols.

21. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of claims~~ claim 16 ~~through 20~~, wherein ~~characterized in that~~ the step of determining a desired synchronization position further comprises:

determining ~~(403)~~ a number of estimates (h) of the transmission channel as a function of the synchronization position (p) and a size of the equalizer window (m); and

determining ~~(405)~~ a desired synchronization position and a desired size of the equalizer window by calculating ~~(404)~~ an error measure (ε) based on the received signal burst and the determined estimates for a number of selected values of the synchronization position and of the size of the equalizer window, where the values of the size of the equalizer window are selected between predetermined upper (m_u) and lower (m_l) bounds for the size of the equalizer window.

22. (CURRENTLY AMENDED) ~~A~~ The method according to claim 21, ~~characterized in that~~ wherein the predetermined upper and lower bounds for the size of the equalizer window define an interval having a width which is less than four channel taps, preferably less than three channel taps.

23. (CURRENTLY AMENDED) ~~A~~ The method according to claims 21 or 22, ~~characterized in that~~ wherein the method further comprises determining ~~(306, 406)~~ the upper and lower bounds for the size of the equalizer window based on at least a desired size of the equalizer window as determined for a previously received signal burst.

24. (CURRENTLY AMENDED) ~~A~~ The method according to claim 23, ~~characterized in that~~ wherein the step of determining the upper and lower bounds for the size of the equalizer window further comprises:

determining a reference window size by means of an auto regressive filter which is updated for at least a subset of received bursts based on the determined desired size of the equalizer window for each of at least the subset of received bursts; and

selecting the upper and lower bounds for the size of the equalizer window to define an interval having a predetermined width around the determined reference window size.

25. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of claims~~ claim 21 ~~through 24~~, wherein ~~characterized in that~~ the step of determining a desired synchronization position and a desired size of the equalizer window comprises calculating a difference between a calculated signal power of the received signal and a scaled power of a set of channel taps of the estimate of the transmission channel.

26. (CURRENTLY AMENDED) ~~A~~ The method according to claim 25, ~~characterized in that~~ wherein the method further comprises scaling the calculated difference with a penalty factor penalizing large equalizer windows.

27. (CURRENTLY AMENDED) ~~A~~ The method according to claim 26, ~~characterized in that~~ wherein the penalty factor comprises an exponential function of the equalizer span with a base determined by a length of the training sequence.

28. (CURRENTLY AMENDED) ~~A~~ The method according to ~~any one of the claims~~ claim 21 ~~through 27~~, ~~characterized in that~~ wherein the step of determining a number of estimates of the transmission channel comprises determining channel taps of the estimate of the transmission channel for different synchronization positions and different sizes of the equalizer window by a two-dimensional recursive computation step.

29. (CURRENTLY AMENDED) An arrangement for estimating a transmission channel ~~(302)~~ in a digital communications system including a receiver ~~(303)~~ for receiving signal bursts of a communications signal via the transmission channel, the receiver comprising a channel estimation-based equalizer ~~(308)~~ having an equalizer window, the arrangement comprising:

means ~~(304)~~ for receiving a signal burst of the communications signal over the transmission channel, the signal burst including a sequence of training symbols;

means ~~(305)~~ for determining ~~(305)~~ a desired synchronization position ~~(203)~~ of the sequence of training symbols with respect to the received signal burst from a number of estimates (h) of the transmission channel corresponding to a number of selected values of the synchronization position (p);

~~characterized in that the arrangement further comprises~~ means ~~(306)~~ for determining an upper and a lower bound for the synchronization position based on at least a desired synchronization position determined for a previously received signal burst; and

wherein the means for determining a desired synchronization position is further adapted to select the number of selected values of the synchronization position between the determined upper and lower bounds for the synchronization position.

30. (CURRENTLY AMENDED) A receiver ~~(303)~~ for receiving signal bursts of a communications signal via a transmission channel ~~(302)~~ in a digital communications system, the receiver comprising a channel estimation-based equalizer ~~(308)~~ having an equalizer window and an arrangement for estimating the transmission channel, the arrangement comprising:

means ~~(304)~~ for receiving a signal burst of the communications signal over the transmission channel, the signal burst including a sequence of training symbols;

means ~~(305)~~ for determining a desired synchronization position ~~(203)~~ of the sequence of training symbols with respect to the received signal burst from a number of estimates (h) of the transmission channel corresponding to a number of selected values of the synchronization position (p);

~~characterized in that the arrangement further comprises~~ means ~~(306)~~ for determining an upper and a lower bound for the synchronization position based on at least a desired synchronization position determined for a previously received signal burst; and

wherein the means for determining a desired synchronization position is further adapted to select the number of selected values of the synchronization position between the determined upper and lower bounds for the synchronization position.